**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**Before the Board of Patent Appeals and Interferences**

In re Patent Application of — Atty Dkt. 3638-116 (AMK)

C# M#

Confirmation No. 9151

BEAN et al. — TC/A.U.: 3634

Serial No. 10/786,158 — Examiner: A. Chin Shue

Filed: February 26, 2004 — Date: February 3, 2009

Title: LIFT VEHICLE WITH MULTIPLE CAPACITY ENVELOPE CONTROL SYSTEM AND METHOD

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). — $540.00 (1401)/$270.00 (2401) — $

☒ An appeal **BRIEF** is attached in the pending appeal of the above-identified application — $540.00 (1402)/$270.00 (2402) — $ 540.00

☒ Credit for fees paid in prior appeal without decision on merits — -$ ( 510.00)

☐ A reply brief is attached. — **(no fee)**

☐ Pre-Appeal Brief Request for Review form attached.

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**TOTAL FEE** $ 30.00

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BEAN et al. Atty. Ref.: 3638-116 (AMK)

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For: LIFT VEHICLE WITH MULTIPLE CAPACITY ENVELOPE CONTROL SYSTEM AND METHOD

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February 3, 2009

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## APPEAL BRIEF

Sir:

Appellants hereby **appeal** to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

## TABLE OF CONTENTS

## (I) REAL PARTY IN INTEREST

The real party in interest is JLG Industries, Inc., a corporation of Pennsylvania.

## (II) RELATED APPEALS AND INTERFERENCES

The Appellants, the undersigned, and the assignee are not aware of any related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this Appeal.

## (III) STATUS OF CLAIMS

Claims 1-23 are present in this application. Claims 1-9, 11 and 12 have been rejected and are on appeal, and claims 13-23 have been withdrawn from consideration.

## (IV) STATUS OF AMENDMENTS

No amendments have been filed since the date of the last Office Action.

## (V) SUMMARY OF CLAIMED SUBJECT MATTER

The invention relates to an aerial work platform vehicle including a multiple capacity system with multiple envelope control. With reference to FIG. 1, an aerial work platform (AWP) vehicle 10 generally includes a vehicle base 12 supported by a plurality of wheels 14. A counterweight 16 is fixed to the vehicle base 12 to counterbalance turning moments generated by the vehicle boom components. The vehicle base 12 also houses suitable drive components coupled with the vehicle wheels 14 for driving the vehicle. See page 6, lines 4-8.

A telescoping tower boom 18 is pivotally coupled at one end to the vehicle base 12. A lifting member 20 such as a hydraulic cylinder is disposed between the tower boom 18 and the vehicle base 12 for effecting tower lift functions. The tower boom 18 includes telescope sections that are coupled with suitable driving means to effect telescope extend/retract functions. A nose pin 22 of the tower boom is disposed at an uppermost end of the tower boom 18 opposite the end pivotally attached to the vehicle base 12. See page 6, lines 9-15.

A main boom 24 is pivotally coupled to the tower boom 18 at the tower boom nose pin 22. The lifting mechanism 26 drives a position of the main boom 24 relative to the tower boom 18. An aerial work platform 28 is supported by a jib arm 29 pivotally secured to an outermost end of the main boom 24. See page 6, lines 16-22.

In contrast with conventional articulating AWP vehicles, the tower boom 18 and the main boom 24 are without a conventional upright between them. The vehicle 10 rather utilizes sensors for sensing an angle of the main boom relative to gravity. In

particular, an inclinometer 30 is attached to the tower boom 18 for measuring an angle of the tower boom 18 relative to gravity. A rotation sensor 32 is coupled between the tower boom 18 and the main boom 24 for determining a relative position of the tower boom 18 and the main boom 24. A control system 34 controls lift and telescope functions of the tower boom 18 and the main boom 24. Output from the inclinometer 30 and the rotation sensor 32 are processed by the controller 34, and the main boom angle relative to gravity can thus be determined. Alternatively, an inclinometer may be coupled directly with the main boom. See page 6, line 23 – page 7, line 6.

With reference to FIGS. 2 and 4, a plurality of sensors detect various positions of the vehicle components, which ultimately can be used to determine a position of the platform 28. The sensors include tower length sensor 38, tower angle sensor 30, main boom angle sensor 32, main boom transport length switches 44, and multiple capacity length switches 46. The tower length sensor 38 communicates with the control system 34 to determine a telescoped length of the tower boom 18. The main boom angle sensor 32 communicates with the controller 34 to determine an angle of the main boom 24 relative to the tower boom 18. See page 7, lines 7-19.

The plurality of sensors 30, 32, 38, 44, 46 are strategically positioned on the vehicle 10 to cooperatively define position zones of the aerial work platform 28. With reference to FIG. 3, the position zones defined by the plurality of sensors generally include eight angle regions 48 (R1-R8) and four length regions 50 (A-D). The angle regions 48 correspond to an angle of the main boom 24 relative to gravity. The length

regions 50 correspond to the telescope length of the main boom 24. See page 7, lines 20-29.

A selector switch 36 enables the operator to select between a plurality of capacity modes including at least a low load mode and a high load mode. In the high load mode, the control system 34 selectively prevents one or both of the main lift/lower functions and the main telescope function based on which position zone the aerial work platform 28 is located in. Table 1 on page 8 of the specification lists the functions of the main boom 24 as main lift up, main lift down, main telescope out, and main telescope in. The control system permits the noted functions depending on the position zone in which the aerial work platform 28 is located. Table 1 lists the angle regions 48 in which the functions are permitted according to which length region 50 is detected. See page 8, lines 1-11 and Table 1.

With reference to FIG. 4 and Table 2, each of the main transport switches 44 rides on respective cam surfaces 51, 52 as the main boom 24 is telescoped in and out. Similarly, the multiple capacity switches 46 each rides on respective cam surfaces 53, 54. Depending on whether the switch combination 44, 46 is "on cam" or "off cam," the control system 34 can determine in which length zone the main boom 24 is positioned. Table 2 on page 9 of the specification lists the possible readings of the transport switches 44 and the multiple capacity switches 46 and the control system's 34 respective conclusion regarding the length region 50 for each set of switches. With this information, the control system 34 makes the conclusion of main boom length (length region) based

on the separate conclusions from the respective switches 44, 46. See page 8, line 23 – page 9, line 6 and Table 2.

In operation, the control system 34 displays the selected capacity mode on both platform and ground displaying panels, and as noted, controls the positions of the boom within the allowable envelope for that mode. See page 9, lines 20-33.

Specific Support for Independent Claims

1. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode; [page 8, lines 1-3]

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and [page 7, lines 20-21]

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in. [page 7, lines 7-17; page 8, lines 1-7; and page 9, lines 20-22]

5. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being

configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode; [page 8, lines 1-3]

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and [page 7, lines 20-21]

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls an envelope of the platform based on a position of the selector switch, [page 7, lines 7-17; page 8, lines 1-7; and page 9, lines 20-22]

wherein the position zones defined by the plurality of sensors comprise a plurality of angle regions corresponding to an angle of the main boom relative to gravity and a plurality of length regions corresponding to a telescoped length of the main boom. [page 7, lines 20-29]

12. A lift vehicle comprising:

a vehicle base; [page 6, lines 4-8]

a tower boom pivotally coupled at one end to the vehicle base; [page 6, lines 9-15]

a telescoping main boom pivotally coupled to the tower boom at an opposite end thereof; [page 6, lines 16-20]

a platform mounted to the telescoping main boom, the telescoping main boom being configured for lift/lower function and telescope function; and [page 6, lines 16-22]

a multiple envelope control system including:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode, [page 8, lines 1-3]

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform, and [page 7, lines 20-21]

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in. [page 7, lines 7-17; page 8, lines 1-7; and page 9, lines 20-22]

## (VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-3, 5-9 and 11 are unpatentable under 35 U.S.C. §103(a) over "JLG Inc. 1350SJP" (JLG) in view of British Patent 941,833 (BP '833).

2. Whether claim 12 is unpatentable under 35 U.S.C. §103(a) over JLG in view of BP '833 and U.S. Published Patent Application No. 2003/0173151 to Bodtke et al.

3. Whether claim 4 is unpatentable under 35 U.S.C. §103(a) over JLG in view of BP '833 and U.S. Patent No. 4,456,093 to Finley et al.

4. Whether claims 3 and 5-7 are unpatentable under 35 U.S.C. §103(a) over JLG in view of BP '833 and U.S. Published Patent Application No. 2004/0200644 to Paine et al.

## (VII) ARGUMENT

1. Claims 1-3, 5-9 and 11 are not unpatentable under 35 U.S.C. §103(a) over "JLG Inc. 1350SJP" (JLG) in view of British Patent 941,833 (BP '833).

At the outset, Appellants respectfully submit that the Office Action fails to set forth a *prima facie* case of obviousness. The rejection lists claims 1-3, 5-9 and 11 as rejected on these grounds. On page 4 of the Office Action, however, the Examiner recognizes that JLG in view of BP '833 lacks at least structure that determines an angle of the main boom relative to gravity (as defined in claims 3 and 5), the eight angle regions and four length regions (as defined in claim 6), and the corresponding control schedule (as defined in claim 7). Since at least this subject matter is lacking in JLG in view of BP '833, Appellants submit that the rejection is *per se* misplaced.

Claim 1

With reference to claim 1, JLG and BP '833 lack at least the claimed plurality of sensors strategically positioned on the main boom that cooperatively define position zones of the platform. In contrast, BP '833 describes the use of manually operated switches CS-1, CS-1A . . . CS-6, CS-6A. These switches are provided in the workman's basket and in a ground control. The limit switches in BP '833 do not define position zones of the platform but rather serve as mechanical operators that physically control a position of the boom sections based on a position of the boom sections relative to the vehicle base. For example, BP '833 describes that limit switch LS-1 serves to limit the maximum extension of the inner boom section 32; limit switch LS-2 limits the maximum retraction of the inner boom section with respect to the outer boom section; limit switches LS-3 and LS-4 serve to limit the maximum upward movement of the boom and to limit

the maximum downward movement of the boom, respectively; and switch LS-5 serves as a back-up for limit switch LS-3. When these switches are tripped by mechanical engagement, a position of the boom sections is adjusted.

The operation of the lifting equipment described in BP '833 begins on page 5, line 4. For example, with reference to Fig. 10, assuming it is desired to move the boom structure into quadrant B from quadrant C with the boom structure fully extended, BP '833 describes that as soon as the boom structure is moved into quadrant B, a raised portion 56b of cam 56 engages a cam follower 57 of the switch F and operates it to move the operating arm 61 to open the sets of contacts F-1A, F-2A and F-3. With F-3 in an open position, it is impossible to continue rotation of the boom structure into quadrant B until the boom structure is retracted. See page 5, lines 78-93. Thus, control of the boom structure is effected via physical contact of the boom structure with cams, switches and the like. It is thus clear then that the quadrants A-D as shown in Fig. 10 are not defined by sensors positioned on the main boom, but rather are defined by a complex arrangement of mechanically driven cams, chains, input switches, and limit switches to prevent movements of the boom structure into certain zones related to chassis position.

In contrast with this structure, claim 1 defines a plurality of sensors that are strategically positioned on the main boom and cooperatively define position zones of the platform. The control system receives output from the sensors to determine in which position zone the platform is located. BP '833 lacks any such sensors as well as any communication between sensors, switches or the like and a control system that determines a position zone in which the platform is located.

Claim 1 further recites that the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in. Without a controller, BP '833 is unable to provide this feature of the invention in order to modify the JLG device. In fact, the BP '833 structure is not suited for a system including a selector switch that changes an envelope of the platform since the cams, limit switches and the like are positionally fixed relative to the boom structure, and different envelopes of the platform could not be achieved.

Regardless, JLG and BP '833 lack at least the claimed plurality of sensors that cooperatively define position zones of the platform and similarly lack the claimed control system that communicates with the sensors to determine in which position zone the platform is located and to control operation of the main boom based on which position zone the platform is located.

Appellants thus respectfully submit that the rejection of claim 1 is misplaced.

Claim 5

Independent claim 5 similarly defines a plurality of sensors that cooperatively define position zones of the platform. Claim 5 further recites that the position zones defined by the sensors comprise a plurality of angle regions corresponding to an angle of the main boom relative to gravity and a plurality of length regions corresponding to a telescoped length of the main boom. As noted, the JLG and BP '833 lack any teaching or suggestion of the claimed position zones as discussed above. As such, JLG and BP '833 also lack such zones comprising a plurality of angle regions and a plurality of length

regions as claimed. The position zones defined in BP '833 primarily relate to rotation or swing angle to take advantage of the stability over the end versus over the side of the truck as well as avoiding hitting the cab of the truck with the boom. With reference to the discussion above, JLG and BP '833 similarly lack the claimed control system that communicates with the plurality of sensors to determine in which position zone the platform is located. Appellants thus submit that the rejection of claim 5 is also misplaced.

Claim 12

Independent claim 12 defines subject matter related to that defined in claim 1. Appellants thus respectfully submit that the rejection of claim 12 is also misplaced for at least the reasons discussed above with regard to claim 1.

Dependent Claims

With regard to the dependent claims, Appellants submit that these claims are allowable at least by virtue of their dependency on an allowable independent claim.

Claim 2

Moreover, claim 2 recites that the control system is configured such that when the selector switch is in the high load mode, the control system selectively prevents at least one of the lift/lower function and the telescope function based on which position zone the platform is located in. With reference to the comments above, this subject matter is also lacking in JLG and BP '833. That is, neither JLG nor BP '833 utilizes sensors that communicate with a control system to determine a platform position zone, nor do the references disclose a control system that selectively prevents certain boom functions

based on the detected zone. JLG merely changes an envelope based on a selected capacity mode, and BP '833 fixes boom structure position using mechanical switches, cams and the like and neither communicates with a control system nor uses any such communication to determine a platform position zone.

Claim 8

Claim 8 recites that the plurality of sensors comprise limit switches. Although the use of limit switches in and of themselves is known, such limit switches are not disclosed in JLG or BP '833. The Office Action recognizes that this structure is lacking in JLG, and as discussed above, no such limit switches are disclosed in BP '833, which rather utilizes mechanical cams, followers, switches and the like to fix relative positions of the boom structure.

Claim 11

Claim 11 recites that the control system controls a position of the selector switch according to a sensed load on the platform. Neither reference discloses such subject matter. The Office Action in fact fails to reference even a single teaching in either reference that purportedly meets this feature of the invention..

Reversal of the rejection is respectfully requested

2. Claim 12 is not unpatentable under 35 U.S.C. §103(a) over JLG in view of BP '833 and U.S. Published Patent Application No. 2003/0173151 to Bodtke et al..

Claim 12 defines subject matter similar to that of claim 1. Appellants submit that the Bodtke publication does not correct the deficiencies noted above with regard to JLG and BP '833. As such, Applicants respectfully submit that claim 12 is allowable for at

least the reasons discussed above with regard to claim 1. Reversal of the rejection is respectfully requested

3. Claim 4 is not unpatentable under 35 U.S.C. §103(a) over JLG in view of BP '833 and U.S. Patent No. 4,456,093 to Finley et al.

Without conceding this rejection, Appellants submit that the Finley patent does not correct the deficiencies noted above with regard to JLG and BP '833. As such, Appellants submit that this dependent claim is allowable at least by virtue of its dependency on an allowable independent claim. Reversal of the rejection is requested.

2. Claims 3 and 5-7 are not unpatentable under 35 U.S.C. §103(a) over JLG in view of BP '833 and U.S. Published Patent Application No. 2004/0200644 to Paine et al.

With regard to claims 3, 6 and 7, without conceding this rejection, Appellants submit that the Paine publication does not correct the deficiencies noted above with regard to JLG and BP '833. As such, Appellants submit that dependent claims 3, 6 and 7 are allowable at least by virtue of their dependency on an allowable independent claim.

With regard to claim 5, the Paine publication is cited merely for the proposition of an inclinometer to sense a boom angle relative to gravity. Paine in fact discloses position measuring sensors, load weighing sensors, and an operator display for comparing measured load to allowable load. In Paine, the device shows a load chart of allowable loads indicating different capacities for different positions of the boom. The Paine structure, however, does not in any form allow the operator to select a capacity region to work within or have a control system that attempts to control the boom within these positions. The Paine system is merely a status reporting system. With reference to the comments above regarding JLG and BP '833, the Paine publication similarly lacks the

claimed sensors strategically positioned on the main boom and cooperatively defining position zones of the platform. Paine additionally lacks the claimed control system communicating with the sensors and controlling an envelope of the platform based on a position of a selector switch.

Appellants thus respectfully submit that the rejection is misplaced. Reversal of the rejection is respectfully requested.

## CONCLUSION

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the rejections and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

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## (VIII) CLAIMS APPENDIX

1. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode;

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in.

2. A multiple envelope control system according to claim 1, wherein the control system is configured such that when the selector switch is in the high load mode, the control system selectively prevents at least one of the lift/lower function and the telescope function based on which position zone the platform is located in.

3. A multiple envelope control system according to claim 2, wherein the control system is configured to selectively prevent at least one of the lift/lower function and the

telescope function when an angle of the main boom relative to gravity is between +55° and -45°.

4. A multiple envelope control system according to claim 1, further comprising alarm means for activating an alarm when the platform is placed in a position outside of the envelope.

5. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode;

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls an envelope of the platform based on a position of the selector switch,

wherein the position zones defined by the plurality of sensors comprise a plurality of angle regions corresponding to an angle of the main boom relative to gravity and a plurality of length regions corresponding to a telescoped length of the main boom.

6. A multiple envelope control system according to claim 5, wherein the position zones defined by the plurality of sensors comprise eight angle regions corresponding to

the angle of the main boom relative to gravity and four length regions corresponding to the telescoped length of the main boom.

7. A multiple envelope control system according to claim 6, wherein the control system is configured permit the main boom lift/lower function and telescope function according to the following schedule, where A-D correspond to the four length regions and R1-R8 correspond to the eight angle regions:

| Functions | A | B | C | D |
|---|---|---|---|---|
| Main Lift UP | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R8 |
| Main Lift Down | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R5, R6, R7, R8 |
| Main Tele Out | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R7, R8 | R1, R2, R7, R8 |
| Main Tele In | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R4, R5, R6, R7, R8 | R1, R2, R3, R6, R7, R8 |

8. A multiple envelope control system according to claim 1, wherein the plurality of sensors comprise limit switches.

9. A multiple envelope control system according to claim 8, wherein the position zones defined by the plurality of sensors comprise a plurality of length regions corresponding to a telescoped length of the main boom, and wherein the limit switches comprise first and second multiple capacity switches and first and second main transport switches, the control system being configured to respectively use opposite cam logic with the multiple capacity switches and the main transport switches to determine in which length region the platform is located.

10. A multiple envelope control system according to claim 9, wherein the position zones defined by the plurality of sensors comprise four length regions (A, B, C, D) corresponding to a telescoped length of the main boom, the control system determining which length region the platform is located in according to the following schedule:

| | Switch States/Boom Length Regions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Multiple Cap. Switch #1<br>Multiple Cap. Switch #2 | Off Cam<br>On Cam | Off Cam<br>On Cam | Off Cam<br>On Cam | Disagree<br>Disagree | On Cam<br>Off Cam | On Cam<br>Off Cam | On Cam<br>Off Cam | Disagree<br>Disagree | Disagree<br>Disagree |
| Control System Conclusion of Multiple Cap Switches | B/A | B/A | B/A | Disagree | C/D | C/D | C/D | Disagree | Disagree |
| Main Transport Switch #1<br>Main Transport Switch #2 | Off Cam<br>On Cam | Disagree<br>Disagree | On Cam<br>Off Cam | On Cam<br>Off Cam | On Cam<br>Off Cam | Disagree<br>Disagree | Off Cam<br>On Cam | Off Cam<br>On Cam | Disagree<br>Disagree |
| Control System Conclusion of Main Transport Switches | A/D | Disagree | B/C | B/C | B/C | Disagree | A/D | A/D | Disagree |
| | | | | | | | | | |
| Control System Conclusion of Main Boom Length | A | A/B | B | B/C | C | C/D | D | Switch Fault | Switch Fault |

11. A multiple envelope control system according to claim 1, wherein the control system controls a position of the selector switch according to a sensed load on the platform.

12. A lift vehicle comprising:

a vehicle base;

a tower boom pivotally coupled at one end to the vehicle base;

a telescoping main boom pivotally coupled to the tower boom at an opposite end thereof;

a platform mounted to the telescoping main boom, the telescoping main boom being configured for lift/lower function and telescope function; and

a multiple envelope control system including:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode,

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform, and

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in.

## (IX) EVIDENCE APPENDIX

(NOT APPLICABLE)

## (X) RELATED PROCEEDINGS APPENDIX

(NOT APPLICABLE)